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in Adobe Deposits in the Valley of Mexico,' by Dr. Lumholtz and Dr. Hrdlicka; it was presented by the junior author, and illustrated by photographs, diagrams and tables. The skeleton presents several remarkable features which were described in detail; in general it is of strikingly low somatic type. The characters, particularly of the skull, differ from those of the Aztec or Nahuatlans and approach those of other ancient inhabitants of the same valley, especially the so-called Toltecs. The paper was discussed at length by Dr. Matthews, Professor Morse and others, the former pointing out, by reference to many examples, the general fact that supposedly low somatic characters frequently result from the form of exercise determined by the habits of life of certain tribes; he referred especially to the olecranon perforation, which he ascribes to the custom of grinding on the metate. Several papers were then read by title, and the scientific work of the section was brought to a close by a highly suggestive communication on 'The Genesis of Implement Making,' by Frank Hamilton Cushing, which will appear elsewhere in this JOURNAL.

The session was brought to an end within the last minute of the time allotted to the sectional work at the Detroit meeting, every moment of the working time having been occupied. In a vote of thanks to the presiding officer of the section, courteously presented by Miss Fletcher, special reference was made to this activity; and in seconding the motion, ex-President Morse observed that, during the many years of his connection with the Association, he had never seen the sectional work performed with so great harmony and scientific zest.

ANITA NEWCOMB MCGEE, *Secretary*.

COLUMBIA UNIVERSITY ZOOLOGICAL EXPEDITION OF 1897.

THE results obtained by the zoological expedition sent out by Columbia University

in the summer of 1896 were so valuable as to warrant a second expedition to continue the examination of the waters of the north-west Pacific coast. It was decided this year to carry the exploration to Alaska and to examine new regions on Puget Sound, in the vicinity of Port Townsend.

As before, the party obtained the most satisfactory rates from the Canadian Pacific Railroad, and it gives me great pleasure to say that the magnificence and grandeur of the scenery along the route is not the only recommendation for the road. The great care taken for the safety of their passengers, together with many courtesies and polite attentions which we received from every official with whom we came in contact, added greatly to the pleasures of the trip.

I also take this occasion to thank Lieutenant Hetherington, U. S. N., of the Bremerton Naval Station, for many courtesies shown us both before and after our arrival at Port Orchard.

The original members of the party were G. N. Calkins (in charge), N. R. Harrington, B. B. Griffin, J. H. McGregor and F. P. Keppel. Professor E. B. Wilson and Professor F. E. Lloyd joined the party somewhat later. We reached Port Townsend, which again was to be our headquarters, on the morning of June 16th. There was little to be done at this time, for our experience last year had shown that few of the marine forms were ripe so early in the season. We added a few new species, however, to our collection of last year; among them were three siphonophores (*Monophyes*, *Diphyes* and *Physophora*); one ctenophore (*Beroë*); five medusæ, one nudibranch mollusc; one turbellarian, a lizard and a snake, but our attention was turned mostly towards our anticipated excursions to Port Orchard, to Sitka, Alaska, and to Neah Bay. Owing to the lateness of the maturation-period in the cold waters

of Puget Sound, we decided to go to Alaska as soon as possible and to stay there as long as favorable results could be expected. We looked forward to this trip with great expectations, for every one had spoken of the richness of the fauna in Sitka harbor, where the water is more shallow than in Puget Sound and from six to ten degrees warmer. Furthermore, through the kind agency of Captain Young, of the Marine Barracks at Sitka, Captain Symonds, of the warship 'Pinta,' had offered us the use of one of the Pinta's steam launches for dredging purposes. Everything, therefore, seemed more favorable for good collecting than at Port Townsend.

In the meantime the excursion to Port Orchard was planned and executed. Port Orchard lies across Puget Sound from Seattle and consists of several bays connected by deep channels of swiftly running water characteristic of this inland sea. In some of the pockets in these bays the tides are so little felt that the water is practically still and considerably warmer than the outer waters.

The swift water of the channels promised good dredging, but unfortunately we took with us our lightest dredge which was practically useless in the current; one fine brachiopod (*Terebratulina*) alone could hardly console us in our disappointment. The best results were obtained on shore, where Mr. Griffin found quantities of *Tycho-dera* (a genus of Enteropneusta), while hydroids of many kinds were as characteristic as their absence at Port Townsend. We left Port Orchard with the intention of returning in August, when, with a heavier dredge, we might expect better results.

The trip to Sitka offered few chances for zoological work. Happening to reach Fort Wrangle, however, at low tide, two of the party found a number of fine specimens of *Echiurus*, a form which we had not found in Puget Sound. On a previous trip to Alas-

ka, Mr. Calkins had found a large number of ice worms (*Dendrobæna*) on the top of Muir Glacier. Although these interesting forms have been repeatedly described, this is the first time they had been found on the Alaska glaciers. They were most numerous in the clear water of pools in hollows of the ice, although in many cases they were found deeply imbedded in the solid ice, which had to be shaved down before the animals could be reached. This year the ascent of the glacier was not only extremely difficult, but, owing to the disappearance of the ice bridge, it was impossible to get on the top of the clear ice as last year. We accordingly found comparatively few ice worms.

We reached Sitka July 14th, with the loss of one package of collecting tools, which had been dropped overboard at Port Townsend during careless handling of the freight. These tools were fished out and sent to us by the next boat. A small house by the water was soon fitted with shelves and made into a somewhat cramped but convenient laboratory. We were much disappointed to find that the 'Pinta,' having been ordered south to the repair shops, had indeed left her steam launches, but with no one to run them. There was no other steam launch available, and all dredging, therefore, had to be abandoned, save such as could be ineffectually done with a sail boat. This deprivation was much more serious than any we had yet encountered, for we soon found that Sitka harbor itself is poorly adapted for good dredging, having an extremely rough, rocky bottom. The good dredging grounds, *i. e.*, bays with sandy bottoms, such as Silver Bay, Crab Bay, etc., were too far away to be reached by sail boat, although a launch could have made the round trip comfortably in one day. We were thus forced to confine our attention to low-water collecting. In this we were very successful. The tides ran out for a considerable distance, leaving

great stretches of rock and sand exposed. The most striking thing in regard to these rocks was the richness of many-hued sponges, of Bryozoa covering rocks and weeds with fleshy or encrusting colonies; while under the rocks, in addition to the usual crabs, star-fish and annelids, rarer forms of nemerteans, echiurids and sipunculids were frequently found. The small patches of sand and shell between the rocks contained quantities of gigantic *Nephtys*, *Amphitrite*, *Synapta* and sand anemones, while in certain regions groups of *Edwardsia*, lamellibranchs and various annelids might be dug up.

On the numerous rocky islands which abound in Sitka harbor we found great numbers of sea urchins, the large *Sphærechinus* in particular, which were neatly dissected for us by the noisy ravens whenever left in the tide pools. Here, too, were found many kinds of actinians, *Thysanurans* in abundance, and various hydroids. Under the wharf and on the piles were great forests of campanularian hydroids ensnaring quantities of copepods, nematodes, nudibranch molluscs and infusoria; while on them, as parasites, gigantic acinetans were abundant. Smaller single hydroids living on mollusc shells and on the piles were added to our collections, while an occasional holothurian (*H. Californica*) might be fished out with a long pole. Professor Wilson and Mr. Harrington found this echinoderm in great abundance on a sandy bottom at Redoubt, some twelve miles from Sitka, and in them an occasional *Entoconcha*.

The rocks under the wharf were carpeted with a thick velvet of Bryozoa, chiefly *Alcyonidiidæ*, *Cellulariidae* and *Diastoporidæ*, and many different genera were well represented. Medusæ were abundant near the shores among the eel grasses and kelp. These were chiefly anthomedusæ and leptomedusæ, although *Haliclystus*, of the order

stauromedusæ was occasionally found. The 'Elbowed' medusa described by Agassiz was especially abundant, while *Polyorchis ceruleus*, scyphomedusæ and several different species of *Thaumantias* were less numerous. Large specimens of *Salpa* sometimes drifted in from the Pacific, but ascidians were less numerous than at Port Townsend.

One of the most attractive methods of collecting at Sitka was by skimming; here, at high water, the tow was wonderfully rich, a single pipette full of the sediment from one tow was found to contain quantities of pteropod larvæ, the *Mitraria* larva of Metschnikoff, the *Actinotrocha* larva, *Polygordius* trochophores, a great species of *Appendicularia*, Pilidium larvæ, a pelagic rhabdocoel turbellarian, Auricularian and Bipinnarian larvæ, etc.

The collection and preservation of these interesting and often rare forms was not the only line of research. Cytological material for many different investigations was preserved. This included a series of maturation and fertilization stages of *Sphærechinus*, maturation and fertilization of *Edwardsia*, maturation material of *Thaumantias*, material for spermatogenesis of *Nephtys*, a full set of material for the development of medusa buds of *Plumularia*, maturation material of *Echiurus*, of *Holothuria*, maturation and fertilization of eggs of a lamellibranch, growth and embryological material of atunicate, etc. In addition to this, notes were kept on the distribution of forms on rocks, piles or pelagic, and of course many notes on the habits, appearance and movements of the living animals.

Taking all into consideration, however, we are forced to the conclusion that, for shore collecting at least, Sitka is less favored than Port Townsend, where the great stretches of tide flats, shaded by long lines of wharves with innumerable piles, offer advantages for shore collecting hardly to be

surpassed. What our impression of Sitka might have been had we had the use of a launch for dredging can only be inferred; from the nature of the littoral fauna and from the pelagic forms it seems as though we might have found great richness at depths from five to twenty fathoms.

Owing to our limited resources for collecting at Sitka, and to the desire to get back to Puget Sound in time for embryological investigations, we decided to return to Port Townsend at the end of three weeks. Here we were met by an unforeseen difficulty. It was in the very midst of the tourist season, and in addition to the usual tourists many Christian Endeavorers had taken the opportunity to visit Alaska. The result was that the regular boats were overcrowded, and our only chance of getting away at the time desired was on some steamer coming north with miners and returning light. Such a chance was offered by the 'Mexico,' an extra boat put on to meet the rush to the Klondike. The 'Mexico' arrived at Sitka August 3d, after leaving about 300 miners at Skaguay and Dyce, and, as anticipated, she was practically empty for the return trip.

The captain of the 'Mexico,' who had lost time on the trip north, wanted to save time on the return trip, and decided to take the outside passage from Sitka, thereby saving sixteen hours on the usual time of the inside passage. It was the intention at first to enter the inside passage north of Mary Island, but later it was decided to run down to Dixon Entrance before leaving the open Pacific. We reached the entrance about midnight, but a light fog had settled, and for some hours the pilot caused the vessel to beat around at half speed or else to lie quiet. The water was too deep to anchor, and the effect of the strong currents on the vessel's course was not properly reckoned, for at four o'clock in the morning of August 5th the order was given to go ahead at full

speed, and twenty minutes later the 'Mexico' crashed into West Devil Rock, a charted rock some distance (3-7 miles) out of the regular course. The hole made in the bottom of the vessel was beyond question of repair, and at 6.30 a. m. she sank out of sight in 500 feet of water.

After eighteen or twenty hours in the open boats the passengers were landed at the Indian village of New Metlahkatlah, where they were taken care of by the Indians and their chief, Father Duncan, until the 'Topeka' called for them, two days later, and carried them back to Puget Sound. Nothing was saved but the hand baggage; most of the instruments and all of our scientific material, reagents, notes, books and theses, representing not alone the summer's work, but unfortunately also much work of the previous year, now lie at the bottom of Dixon Entrance.

Without reagents and instruments and feeling more or less upset by the shock of the wreck, the entire party found it difficult to settle down again for work. A few dredging trips, however, enabled Mr. Harrington to renew his supply of *Entoconcha*, while turbellaria, molluscs and some coelenterates were found in full maturity. The party soon broke up, and the material collected at Port Townsend and Port Orchard alone represents the work of the expedition of 1897.

GARY N. CALKINS.

*MIMICRY IN BUTTERFLIES OF THE GENUS
HYPOLIMNAS AND ITS BEARING ON
OLDER AND MORE RECENT THE-
ORIES OF MIMICRY.**

THE theory of mimicry suggested by H. W. Bates, in 1862, explained the superficial resemblance of a rare to a common species in the same locality by supposing that the latter possessed some special means of defence (such as unpleasant taste, smell, etc.),

* Abstract of a paper presented by E. B. Poulton before the Section of Zoology of the American Association for the Advancement of Science.